

ABSTRACT

5 The present invention utilizes voltage coupling effects of MOS capacitors to support logic operations for integrated circuits such as programmable logic array, optical sensors, comparators, and storage devices. Additional flexibility is achieved by using the voltage coupling effects of floating gate capacitors to support applications such as field programmable logic and non-volatile memory devices. Integrated circuits of the present invention occupy much smaller areas comparing to equivalent prior art integrated circuits, achieving dramatic cost reduction. Further
10 cost reduction can be achieved by fabricating coupling circuits of the present invention on low quality substrates as 3 dimensional devices.

15 The major drawback of the present invention is smaller signal to noise ratio, which is overcome by proper voltage control and sensing circuits. Special considerations to support hot carrier programming and current mode reading are also disclosed in this patent.